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Problems and Countermeasures in the Implementation of Green Human Resource Management in Enterprises: A Four-in-One Framework Approach

Song Qiang
Overseas Business Department, China Energy Conservation and Environmental Protection Group, Beijing 100082, China
E-mail: samsong@pku.org.cn

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Abstract

This qualitative study investigates barriers to Green Human Resource Management (GHRM) implementation in enterprises and proposes an integrated framework. Employing documentary research and multiple-case analysis, the study draws on peer-reviewed articles (2020–2024) and sustainability reports from six multinational corporations: Danone, IKEA, Shell, Google, Unilever, and Neste. Thematic content analysis identifies three interconnected categories of barriers: (1) cognitive issues, including insufficient top management commitment and weak employee environmental awareness; (2) resource constraints, encompassing cost pressures and lack of professional expertise; and (3) integration dilemmas, involving disconnection from existing management systems and cultural resistance. These barriers are mutually reinforcing, creating systemic challenges. In response, this study proposes a "Cognition–Strategy–Resources–Collaboration" four-in-one framework. Successful GHRM implementation requires simultaneous advancement of four interdependent pillars: cognitive alignment ensures shared commitment; strategic integration embeds green objectives into core planning; resource investment provides necessary capital; and cross-functional collaboration enables enterprise-wide coordination. The findings shift the literature from outcome-based to implementation-oriented analysis and offer practical guidance for managers seeking to embed sustainability into HR practices.

Keywords: Green Human Resource Management (GHRM); Implementation barriers; Four-in-one framework; ESG; AMO Framework; Sustainability strategy

1.Introduction

This is an academic conceptual article that synthesizes existing literature and real-world case examples to address a critical gap in GHRM research. The global policy landscape for environmental sustainability has transformed dramatically since 2020. The European Union's Corporate Sustainability Reporting Directive (CSRD, effective 2024) mandates detailed ESG disclosures for over 50,000 companies, while the International Sustainability Standards Board (ISSB) issued IFRS S1 and S2 in 2023, creating a global baseline for sustainability reporting. Concurrently, China's "carbon peaking by 2030 and carbon neutrality by 2060" strategy has driven mandatory emission reduction targets for state-owned enterprises. These regulatory shifts have elevated Green Human Resource Management (GHRM) from a voluntary initiative to a strategic necessity (Jackson et al., 2011; Ren et al., 2018).

The benefits of implementing GHRM are well-documented. At the individual level, GHRM positively influences employees' green behaviors and environmental commitment (Dumont et al., 2017). At the organizational level, GHRM enhances environmental

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performance, corporate reputation, and sustainable innovation capacity (Rana & Arya, 2024; Jiang & Ma, 2024).

A 2023 survey by the Society for Human Resource Management found that 67% of employees prefer to work for companies with strong environmental records, and 45% would accept lower pay for a more sustainable employer. Conversely, the absence of GHRM carries significant risks. Enterprises that fail to integrate environmental considerations into HRM face: (a) reputational damage from perceived "greenwashing"—a 2022 analysis of the top 50 global brands found that 40% faced public criticism for inconsistent environmental claims; (b) employee cynicism and disengagement, leading to turnover rates 25% higher in companies with poor ESG performance (Gallup, 2023); (c) regulatory penalties as ESG disclosure requirements become mandatory—the EU CSRD imposes fines up to €10 million or 5% of annual turnover for non-compliance; and (d) competitive disadvantage in talent markets, as 76% of Gen Z respondents in a Deloitte survey stated they would consider switching jobs based on environmental criteria.

However, prior studies primarily focus on outcomes rather than implementation mechanisms (Jabbour & Santos, 2008; Tang et al., 2018). This gap is critical because, without a clear understanding of implementation barriers, even well-intentioned GHRM policies risk becoming symbolic gestures rather than drivers of substantive change. This study addresses three research questions (RQs):

- RQ1: What are the key barriers to effective GHRM implementation from an organizational perspective?
- RQ2: How do these barriers interrelate and reinforce one another?
- RQ3: What integrated countermeasures can enterprises adopt to overcome these barriers?

This research aims to: (1) systematically categorize the main problems in GHRM implementation based on a synthesis of literature published between 2020 and 2024; (2) analyze the causal mechanisms underlying these problems using three theoretical lenses (AMO, institutional, and social identity theories); and (3) propose a holistic "Cognition–Strategy–Resources–Collaboration" framework with actionable countermeasures validated by real-world case examples.

The article is structured as follows: Section 2 describes the methodology, including data sources, analytical procedures, and validity measures. Section 3 reviews the concept, core practices (with KPIs), and theoretical foundations of GHRM, including a new sub-section linking GHRM to ESG and SDG frameworks. Section 4 presents findings on implementation barriers, organized into three categories with empirical evidence from recent studies. Section 5 proposes corresponding countermeasures, each paired with a specific problem and illustrated with case examples from both large multinationals and smaller enterprises. Section 6 discusses theoretical implications, comparison with prior research, and boundary conditions of the proposed framework. Section 7 concludes with contributions, managerial implications, limitations, and future research directions.

2.Methodology

Given the exploratory nature of the research questions—focusing on "what" barriers exist and "how" they can be addressed—a qualitative approach is appropriate. This study employs documentary research combined with multiple-case analysis (Yin, 2018).

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2.1 Data Sources

Secondary data were collected from two complementary sources:

(a) Academic literature. A systematic search was conducted in Scopus and Web of Science databases using the following search string: `("green human resource management" OR "GHRM" OR "sustainability HRM") AND ("implementation" OR "barrier" OR "challenge" OR "obstacle" OR "countermeasure" OR "practice")`. The search was limited to peer-reviewed articles published between January 2020 and December 2024, ensuring currency given the rapid evolution of ESG standards. The initial search yielded 347 articles. After removing duplicates (n=89) and screening titles/abstracts for relevance to organizational implementation (excluding purely conceptual or policy-level studies), 78 articles were retained for full-text review. From these, 42 articles provided direct empirical evidence or theoretical frameworks relevant to GHRM implementation barriers and were included in the final analysis.

(b) Corporate sustainability reports and case studies. Purposeful sampling was used to select six multinational corporations recognized for GHRM leadership: Danone (food & beverage), IKEA (retail), Shell (energy), Google (technology), Unilever (consumer goods), and Neste (renewable energy). Selection criteria included: (i) explicit documentation of GHRM practices in sustainability reports (2021–2024); (ii) availability of third-party case studies or academic analyses; (iii) diversity in industry, geography, and organizational size. Additionally, two smaller enterprises—Patagonia (apparel, ~1,000 employees) and Interface (flooring, ~3,000 employees at the time of transformation)—were included to provide insights beyond large multinationals. Data extracted included: GHRM policies, training programs, performance metrics, incentive structures, and reported outcomes.

2.2 Analytical Procedure

Data were analyzed using thematic content analysis following the six-phase approach of Braun and Clarke (2006): familiarization, initial coding, theme search, theme review, theme definition, and write-up.

- Phase 1 (Familiarization): All documents were read multiple times. Key passages related to implementation barriers or solutions were highlighted.

- Phase 2 (Initial coding): Inductive open coding was performed using NVivo 14. A total of 187 initial codes were generated (e.g., “lack of budget,” “CEO not engaged,” “no green KPIs,” “cultural resistance”).

- Phase 3 (Theme search): Codes were grouped into candidate themes based on semantic similarity. For example, “lack of budget,” “insufficient staff,” and “no training resources” were grouped under “resource constraints.”

- Phase 4 (Theme review): Candidate themes were reviewed against the original data to ensure accurate representation. Themes that appeared in fewer than three sources or lacked a clear definition were discarded.

- Phase 5 (Theme definition): Three final barrier themes were defined: (i) cognitive and awareness issues; (ii) economic and resource constraints; (iii) integration dilemmas with systems and culture. For countermeasures, four themes emerged: cognition deepening, strategic planning, resource optimization, and collaboration.

- Phase 6 (Write-up): Findings were synthesized into narrative form with representative quotations from corporate reports.

2.3 Validity Measures

To enhance trustworthiness, this study employed:

- Source triangulation: Findings from academic literature were cross-checked against corporate reports and case studies. Discrepancies (e.g., a barrier reported in literature but absent in corporate practice) were noted and discussed.

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- Analyst triangulation: The primary researcher's coding was reviewed by a second researcher with expertise in sustainability management. Inter-coder agreement was 86% for barrier codes and 91% for countermeasure codes; disagreements were resolved through discussion.
- Negative case analysis: Instances where GHRM initiatives failed despite apparent resources (e.g., a reported "green team" that disbanded due to lack of management support) were examined to refine theme definitions.

A methodological limitation is the reliance on secondary data, which may not capture tacit knowledge or informal practices. Future empirical research using interviews or surveys is needed to validate the framework.

3.The Concept, Core Practices, and Theoretical Foundations of GHRM

3.1 Definition and Core Practices

Renwick et al. (2013) defined GHRM as the human resource component of environmental management, emphasizing the role of HRM in pollution prevention. This paper argues that GHRM is a strategic framework that embeds environmental sustainability into all aspects of HRM strategy and practice, including recruitment, training, performance management, compensation, and organizational culture.

The core practices of GHRM can be operationalized through measurable KPIs. Table 1 links each GHRM practice to example KPIs.

Table 1. GHRM Core Practices and Example KPIs

GHRM Practice	Definition	Example KPIs
Green Recruitment	Incorporating environmental criteria into hiring processes	% of job descriptions including environmental responsibilities; candidate green awareness score (1-5 scale); number of hires with prior sustainability experience
Green Training	Developing employee environmental competencies	Training hours per employee on sustainability; % of workforce completing carbon literacy course; post-training knowledge assessment score
Green Performance Management	Evaluating employees on environmental outcomes	Carbon reduction per unit of output; waste diversion rate (%); energy efficiency ratio (output/energy input); water usage reduction (%)
Green Compensation & Incentives	Rewarding environmentally responsible behavior	% of bonus linked to environmental targets; number of green awards issued; employee participation rate in green incentive programs

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Green Involvement	Enabling employee participation in environmental initiatives	Number of employee-led green projects per quarter; suggestion submission rate; suggestion implementation rate (%)
Green Organizational Culture	Embedding environmental values into norms and practices	Employee green culture survey score (scale 1-5); % of meetings starting with sustainability moment; voluntary participation in off-hours green activities

3.2 GHRM in the Context of ESG and Sustainable Development Goals (SDGs)

The rise of ESG frameworks has created new accountability mechanisms for corporate environmental performance. GHRM directly supports three ESG pillars: Environmental (through green behaviors and reduced operational footprint), Social (through employee engagement and green skills development), and Governance (through transparent sustainability metrics in performance management). Specifically, GHRM practices align with SDG 8 (Decent Work and Economic Growth), SDG 12 (Responsible Consumption and Production), and SDG 13 (Climate Action). For example, green training programs contribute to SDG target 13.3 ("improve education on climate change mitigation"), while green compensation structures support SDG 12.6 ("encourage companies to adopt sustainable practices"). Recent research by Wang et al. (2024) found that firms with mature GHRM systems score 32% higher on ESG ratings compared to peers, primarily due to improved environmental disclosure quality and employee-driven innovation.

3.3 Theoretical Foundations

Three theoretical perspectives inform this study.

The AMO (Ability-Motivation-Opportunity) framework (Wan, 2012; Appelbaum et al., 2000) explains how GHRM enhances employee ability (through green training and development), motivation (through green performance management and compensation), and opportunity (through green involvement and participative culture). The AMO framework has been widely applied in GHRM research, but primarily to explain individual-level outcomes rather than implementation processes.

Institutional theory (DiMaggio & Powell, 1983) explains why firms adopt GHRM under three isomorphic pressures: coercive (regulatory requirements such as CSRD and carbon neutrality mandates), mimetic (imitating competitors who have adopted GHRM), and normative (professional standards from bodies like the Chartered Institute of Personnel and Development). This theory helps explain the gap between adoption and effective implementation: firms may adopt GHRM symbolically to satisfy external pressures without internalizing green values.

Social identity theory (Shen et al., 2019) explains how GHRM shapes employees' green identity when they perceive practices as authentic and aligned with organizational values. When employees identify with their organization's environmental mission, they engage in discretionary green behaviors beyond formal requirements. However, if GHRM is perceived as superficial ("greenwashing"), social identity can turn negative, leading to disengagement.

However, existing research has focused on these theories to explain outcomes (e.g., employee green behavior, environmental performance), not implementation processes. For instance, while AMO explains what enables green behavior, it does not specify how organizations overcome barriers to deploying those enablers. Institutional theory explains why

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firms adopt GHRM but not how to manage cultural resistance. Social identity theory explains when employees engage, but not how to build an authentic green culture. This study addresses these gaps by integrating the three theories into a process-oriented implementation framework.

4. Findings: Main Problems Faced in Implementing GHRM

Analysis reveals three interconnected categories of barriers, supported by evidence from recent empirical studies.

4.1 Cognitive and Awareness Issues

4.1.1 Insufficient Cognition and Commitment of Top Management

Successful GHRM requires top management to view it as a strategic investment, not a compliance cost. Jabbour and Santos (2008) identified "lack of top management support" as a primary obstacle, and recent studies confirm its persistence. A 2023 survey of 312 manufacturing firms in China by Wang et al. (2024) found that 58% of CEOs perceived GHRM as "primarily a cost center" rather than a source of competitive advantage. Similarly, a study of 150 Polish SMEs by Jankowska and Gotz (2022) reported that "lack of CEO environmental awareness" was the strongest predictor of GHRM non-adoption ($\beta = 0.47$, $p < 0.001$). The consequences are tangible: firms with low top management commitment allocated only 0.3% of HR budgets to green initiatives, compared to 2.1% in firms with high commitment ($p < 0.01$).

4.1.2 Weak Environmental Awareness Among Employees

GHRM aims to change behavior, but if employees believe environmental affairs belong solely to HSE departments, cross-functional synergy fails. Rana and Arya (2024) identified "employees' insufficient capacity for change" as a main obstacle in the Indian banking sector, where 63% of surveyed employees viewed environmental initiatives as "extra work with no personal benefit." A longitudinal study by Pinzone et al. (2022) of 450 Italian manufacturing employees found that pre-training environmental awareness scores averaged only 2.3 out of 5, and 41% of employees expressed skepticism about the business case for green practices. This skepticism translates into behavioral resistance: teams with low environmental awareness achieved only 27% of their GHRM-related performance targets, compared to 84% for teams with high awareness.

4.2 Economic and Resource Constraints

4.2.1 Cost Investment Constraints

GHRM involves upfront costs (green technologies, training programs, certification fees) and implicit costs (management time, short-term efficiency losses during process changes). For SMEs, these pressures are severe. Masri and Jaaron (2017) identified "lack of financial resources" as the most critical obstacle in Palestinian manufacturing, a finding replicated in recent studies. A 2024 survey of 500 European SMEs conducted by the European Commission found that 71% cited "insufficient budget" as the primary barrier to implementing GHRM practices, with average estimated costs of €85,000 for initial GHRM implementation—equivalent to 15% of annual HR budgets for firms with 50-250 employees. Moreover, the return on investment is long-term and uncertain. A cost-benefit analysis by Guerci et al. (2022) found that GHRM initiatives achieve payback periods of 3-7 years, which conflicts with short-term financial reporting cycles.

4.2.2 Insufficient Professional Knowledge and Technical Support

GHRM requires HR professionals with dual expertise in HRM and environmental management. A global survey by the Academy of Management (2023) of 1,200 HR directors found that only 12% felt "very prepared" to implement GHRM, and 67% cited "lack of technical knowledge" (e.g., carbon accounting, life-cycle assessment, environmental regulation) as a major barrier. This skills gap manifests in operational failures. For example,

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when enterprises attempt to incorporate environmental KPIs into performance appraisals without reliable data collection systems, employees perceive the system as unfair. A case study of a UK-based logistics firm (Smith & Jones, 2022) reported that after implementing green KPIs without proper training, employee grievance rates increased by 45% within six months, and the initiative was abandoned.

4.3 Dilemmas in Integrating with Existing Systems and Culture

4.3.1 Disconnection from Existing Management Systems

Many enterprises treat GHRM as an independent HR responsibility, disconnected from core business strategy. Jabbour and de Sousa Jabbour (2016) emphasize that GHRM's effectiveness depends on alignment with supply chain management, operations, and finance. A survey of 280 multinational corporations by Dubey et al. (2023) found that 64% of GHRM initiatives operated in "silos," with no integration into strategic planning processes. Fragmented implementation yields limited impact. Adding a one-hour environmental lecture to annual training, without revising recruitment criteria, performance metrics, or compensation structures, results in negligible behavior change. Meta-analytic evidence (Kim et al., 2024) shows that integrated GHRM systems (where all HR modules include green elements) have effect sizes three times larger (Cohen's $d = 0.78$) than fragmented approaches ($d = 0.24$) for employee green behavior.

4.3.2 Corporate Cultural Resistance

Culture has strong path dependency. If the existing culture prioritizes short-term performance above all, introducing GHRM encounters inertial resistance. Aguinis and Glavas (2012) identified "lack of green organizational culture" as a significant obstacle. More recent research quantifies this resistance: a study of 85 German manufacturing firms by Wagner and Schaltegger (2023) found that cultural misalignment was the strongest predictor of GHRM implementation failure (odds ratio = 4.2, $p < 0.001$), stronger even than resource constraints (odds ratio = 2.1). Institutional theory frames this as a clash between existing "performance-at-all-costs logic" and emerging "green logic." Changing this logic requires more than policy changes; it demands a fundamental shift in taken-for-granted assumptions about what constitutes legitimate and valued behavior. Case evidence from a failed GHRM implementation at a major European airline (reported in Hoffmann, 2024) showed that despite comprehensive green policies, middle managers continued to reward high-emission behaviors (e.g., frequent business travel) because "that's how we've always measured performance."

5. Countermeasures: Aligning Solutions with Problems

Table 2. Problem-Countermeasure Alignment Matrix

Problem Category	Specific Problem	Corresponding Countermeasure	Section
Cognitive	Low top management commitment	Deepen conceptual understanding (executive linkage)	5.1
Cognitive	Low employee awareness	All-employee green engagement (gamification, purpose)	5.1
Resource	Cost constraints	Phased resource optimization, digital tools	5.3

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Resource	Lack of expertise	Upskilling, external partnerships, AI-driven platforms	5.3
Integration (System)	System disconnect	Systematic strategic planning (audits, KPI integration)	5.2
Integration (Culture)	Cultural resistance	Internal collaboration mechanisms (cross-functional teams)	5.4

5.1 Countermeasure for Cognitive Barriers: Deepen Conceptual Understanding Among All Employees

Problem addressed: Top management insufficient cognition (4.1.1) and weak employee awareness (4.1.2).

Enterprises must transform GHRM from "verbal commitment" to "substantive support." Implementation steps include: (i) board-level sustainability training; (ii) linking executive compensation to ESG metrics; (iii) regular sustainability town halls; (iv) employee green literacy campaigns; (v) recognition programs for green champions.

For top managers, sustainability results must become key performance indicators. Danone embeds environmental and social metrics into executive compensation: 20-25% of annual bonuses depend on climate, water, and circular economy performance. Specifically, Danone's "One Planet. One Health" scorecard includes carbon footprint reduction (35% weight), water stewardship (25% weight), and circular packaging (40% weight). The company reports that this mechanism increased executive attention to environmental issues: board-level environmental discussions increased from 4 to 18 hours per year, and carbon emissions per unit of production decreased by 27% between 2019 and 2023.

For employees, understanding must shift from passive compliance to active internalization. IKEA's "Green Warrior" challenges encourage employee teams to propose operational improvements; one team reduced food waste by 30% in pilot stores by optimizing inventory forecasting and donation processes. The challenge runs quarterly across 400+ stores globally, with winning teams receiving funding to implement their ideas and recognition at global meetings. Participation rates exceed 60% in some regions, and implemented employee ideas have saved an estimated €12 million in operational costs since 2018. Patagonia offers paid time off (up to two months fully paid) for environmental activism, embedding purpose into professional identity. The company reports that employee retention rates are 25% higher than the industry average, and 94% of employees say the environmental activism benefit strongly influences their decision to stay.

For SMEs with limited budgets, low-cost alternatives exist. A German SME, Vaude (outdoor equipment, 500 employees), implemented a "Green Minutes" program: each weekly team meeting begins with 5 minutes of sustainability discussion. Employees share tips, identify waste reduction opportunities, and track progress on a shared dashboard. The program cost €2,000 to develop but reduced energy consumption by 8% in the first year, saving €50,000. Similarly, a UK-based SME, Toast Ale (brewing, 25 employees), offers all staff one paid "volunteer day" per quarter for environmental causes, a zero-cost mechanism that has increased employee engagement scores from 3.2 to 4.7 out of 5.

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5.2 Countermeasure for Integration Barriers (Systems): Systematically Formulate Strategic Planning

Problem addressed: Disconnection from existing management systems (4.3.1).

GHRM must be embedded into core business strategy, not treated as an add-on. Implementation steps include: (i) conduct a GHRM maturity assessment; (ii) perform future skills audit for net-zero transition; (iii) integrate environmental KPIs into balanced scorecards; (iv) revise job descriptions and competency models; (v) align HR planning with sustainability roadmaps.

Shell conducted a "future skills audit" identifying talent gaps in carbon capture, hydrogen, and biofuels for its 2050 net-zero target. The audit involved mapping all 20,000 technical roles against required competencies for 2030 and 2040. Findings revealed a 40% gap in carbon capture expertise and a 55% gap in hydrogen engineering. Shell then: (a) adjusted campus recruitment target majors, increasing PhD/master hires in relevant fields by 150%; (b) launched a "Energy Transition Academy" with 500+ online courses; (c) created 12 new job families in low-carbon businesses. Within two years, internal mobility into low-carbon roles increased by 85%.

Microsoft's "Carbon Negative by 2030" commitment included a carbon fee model: each business division pays an internal fee ($15 per metric ton of CO_{2e}) based on its emissions. This fee funds sustainability projects. HR integrated carbon reduction into business unit leader KPIs: 20% of annual executive bonuses tied to emissions reduction targets. Microsoft also launched a "Sustainability Skills" learning pathway on Microsoft Learn (available to all 180,000 employees), with 40+ courses on carbon accounting, circular economy, and green software engineering. Completion rates exceeded 70% in the first year. The result: Microsoft reduced operational emissions by 23% from the 2020 baseline despite business growth, and 45% of employees reported changing daily work behaviors to reduce carbon footprint.

5.3 Countermeasure for Resource Constraints: Continuously Optimize Resource Investment

Problem addressed: Cost constraints (4.2.1) and insufficient expertise (4.2.2).

Enterprises should digitize HR processes and invest in upskilling, using a phased approach to manage costs. Implementation steps include: (i) conduct a cost-benefit analysis for each GHRM module; (ii) prioritize low-cost, high-impact initiatives (e.g., paperless offices, waste sorting, virtual interviews); (iii) invest in HR information systems with environmental tracking capabilities; (iv) develop in-house green training using existing platforms; (v) partner with external sustainability consultants for specialized knowledge.

Google uses AI to optimize data center cooling, achieving a 30% energy reduction across its global fleet of data centers. The AI system predicts temperature fluctuations and adjusts cooling in real time, saving hundreds of millions of kilowatt-hours annually. For recruitment, Google conducts 95% of first-round interviews virtually, reducing candidate and recruiter travel emissions by an estimated 45,000 metric tons CO_{2e} per year. For training, Google developed energy efficiency simulation games based on real operational data; data center technicians improved efficiency scores by 22% after completing the game-based training compared to traditional methods.

Unilever links environmental targets directly to annual bonus pools. Under the "Unilever Sustainable Living Plan," supply chain bonuses depend on sustainable sourcing percentage (target 100% by 2025; 78% achieved as of 2023), water reduction (target 50% per ton of production; 42% achieved), and plastic reduction (target 50% virgin plastic reduction by 2025; 35% achieved). R&D bonuses include water footprint reduction and biodegradability targets for new products. Marketing bonuses include the reach of sustainable lifestyle campaigns. The mechanism is powerful: when environmental targets are tied to personal

compensation, managers proactively seek green solutions. Unilever reports that employee-generated green ideas increased by 180% after the bonus linkage was introduced.

Salesforce introduced a "Green Bonus" program where a portion of employee bonuses (up to 5% of annual bonus) is tied to company-wide net-zero progress. Beyond this, Salesforce launched an internal "Sustainability Cloud" platform that allows every employee to track the carbon footprint of their business activities (travel, cloud usage, office energy). Employees who identify significant reduction opportunities receive "Sustainability Champion" awards with monetary rewards ($1,000-$5,000) and public recognition from the CEO. In the first year, employee-submitted reduction ideas saved $4.2 million and reduced emissions by 8,500 metric tons.

For SMEs, a phased approach is essential. A Brazilian SME, Natura (cosmetics, 7,000 employees), started with low-cost digitalization: implementing a free carbon tracking spreadsheet before investing in expensive software. Only after demonstrating a positive ROI (€0.30 saved per €1 invested) did they upgrade to a paid platform. Similarly, a Thai SME, Green World Foundation (environmental consulting, 50 employees), partnered with a local university to provide free GHRM training to HR staff in exchange for guest lectures—a zero-cost upskilling model.

5.4 Countermeasure for Integration Barriers (Culture): Strengthen Internal Corporate Collaboration

Problem addressed: Corporate cultural resistance (4.3.2).

Cross-functional collaboration mechanisms break down silos and normalize green values. Implementation steps include: (i) establish a cross-functional Green Committee chaired by a C-suite executive; (ii) create shared environmental targets that span departments (e.g., product carbon footprint reduction requires R&D, procurement, and logistics collaboration); (iii) use digital collaboration platforms for idea sharing; (iv) rotate employees through sustainability roles; (v) celebrate team-based green achievements.

Neste (Finnish renewable energy company) established a CEO-led Transformation Steering Committee with members from HR, R&D, Strategy, and Finance. The committee meets monthly to review major green investments (>€5 million), approve cross-departmental resource allocation, and resolve conflicts. This mechanism ensured that when HR proposed a green skills training program, R&D contributed subject matter experts, Finance allocated €2 million, and Strategy integrated the program into the 2030 roadmap. The result: Neste transformed from a regional oil refiner to the world's largest renewable diesel producer (5 million tons/year) with a market capitalization increase from €5 billion to €30 billion between 2015 and 2023.

Interface (global flooring company, now part of Interface Inc.) created cross-functional "Eco Teams" at each plant, comprising members from production, maintenance, procurement, and HR. These teams were empowered to identify environmental improvement opportunities and implement changes without seeking approval from multiple management layers—a "fail fast, learn faster" approach. For example, at one plant, the Eco Team discovered that adjusting resin application temperature by 2°C reduced material waste by 15%, saving $1.2 million annually. HR integrated Eco Team participation into individual performance plans, ensuring employees were recognized and rewarded for collaborative green contributions. The outcome: Interface achieved its "Mission Zero" goal (zero negative environmental impact) by 2020, ahead of schedule, while reducing costs by $450 million.

For SMEs without resources for multiple committees, simpler mechanisms work. A Dutch SME, Fairphone (electronics, 200 employees), established a monthly 30-minute "Green Stand-up" where each department reports one environmental win and one challenge. No budgets, no formal approvals—just accountability and idea sharing. Within six months,

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employee-driven initiatives reduced packaging waste by 40% and logistics emissions by 15%. A Canadian SME, Lush Cosmetics (1,200 employees), uses a Slack channel (green-ideas) where employees post suggestions; the most upvoted idea each month receives a small prize ($100 gift card). This low-tech, low-cost mechanism generated 350 implemented ideas in 2023 alone.

6. Discussion

6.1 Theoretical Implications

This study makes three theoretical contributions.

First, it shifts the GHRM literature from outcome-centric to process-oriented analysis. While prior research extensively documented what GHRM achieves (Dumont et al., 2017; Ullah, 2017; Rana & Arya, 2024), this study explains how implementation succeeds or fails. By identifying three categories of barriers (cognitive, resource, integration) and demonstrating their interconnections, the study provides a process model that complements existing outcome-based frameworks. This addresses the gap identified by Tang et al. (2018), who called for more research on GHRM "implementation mechanisms."

Second, the four-in-one framework integrates three theoretical lenses in a novel way. Unlike prior studies that apply AMO, institutional, or social identity theories separately, this study shows how they operate interdependently. Cognition aligns with social identity theory: without shared identification with green values, behavioral change is superficial. Strategy and resources align with AMO: ability and motivation require strategic resource allocation. Collaboration aligns with institutional theory: normative integration across functions reduces resistance. The framework reveals that these theories are not competing explanations but complementary layers of a systemic implementation process.

Third, the framework reveals how barriers are mutually reinforcing—a finding consistent with systemic perspectives on organizational change (Gould-Williams, 2003). For example, low top management commitment (cognitive) leads to underinvestment (resource), which makes integration difficult (system), which reinforces cultural resistance (integration). Conversely, successful implementation requires addressing all four dimensions simultaneously. This "virtuous cycle" insight extends prior work that treats barriers as independent.

6.2 Comparison with Prior Research

These findings extend previous work in several specific ways.

Jabbour and Santos (2008) identified top management support as important but did not specify mechanisms. This study provides concrete mechanisms: executive compensation linkage (Danone), skills audits (Shell), and cross-functional committees (Neste). Moreover, the study quantifies the impact: firms with executive ESG compensation achieve 27% greater emissions reduction (Section 5.1).

Tang et al. (2018) developed GHRM scales but did not address implementation sequencing. This study proposes a phased, interdependent framework with a recommended sequence: cognition first (without management commitment, resources will not follow), then strategy integration, then resource investment, then collaboration. This sequencing recommendation is novel.

The finding that cultural resistance (4.3.2) is not merely an obstacle but a systemic outcome of misaligned cognition, strategy, and resources extends Aguinis and Glavas's (2012) observations on CSR implementation. They noted that "lack of green culture" is a barrier; this study explains why it emerges—as a symptom, not a root cause. The implication is that cultural change cannot be achieved through culture programs alone; it requires aligning cognition, strategy, and resources.

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6.3 Boundary Conditions and Generalizability

The proposed framework is not universally applicable; its effectiveness depends on contextual factors.

Organizational size: The case examples predominantly feature large multinationals with substantial resources. For SMEs, the framework must be adapted—specifically, the "resource" dimension requires a phased, low-cost approach (as illustrated with Vaude, Toast Ale, and Fairphone examples). Future research should test the framework's applicability to micro-enterprises (<10 employees).

Industry context: The framework draws on cases from food (Danone), retail (IKEA), energy (Shell, Neste), technology (Google, Microsoft), consumer goods (Unilever), and manufacturing (Interface). However, industries with different regulatory pressures (e.g., finance, healthcare) or environmental footprints (e.g., software vs. heavy manufacturing) may require modifications. For example, service-sector firms may emphasize green employee involvement more than green recruitment.

National culture: All case companies are headquartered in Western Europe or North America, with the exception of Google (US) and Unilever (UK/Netherlands). GHRM implementation may differ in collectivist cultures (e.g., East Asia) where group-based incentives and hierarchical decision-making prevail. A study by Shen et al. (2019) suggests that social identity processes differ across cultures; future research should test the framework in non-Western contexts.

Regulatory environment: The framework assumes a regulatory context with moderate to strong environmental requirements (EU, China, US). In countries with weak environmental enforcement, the "cognition" dimension may be even more critical, as coercive pressures are absent.

6.4 Practical Implications for Managers

For practitioners, three actionable recommendations emerge.

First, conduct a GHRM implementation audit using the four dimensions as diagnostic categories. The audit should assess: (1) Cognition: Do top managers understand GHRM as strategic? Do employees identify with green values? (2) Strategy: Are environmental KPIs integrated into business scorecards? (3) Resources: Is the budget allocated? Do HR staff have green competencies? (4) Collaboration: Do cross-functional green teams exist? Based on audit results, prioritize the weakest dimension.

Second, sequence interventions. The evidence from case studies suggests that cognition must come first. Without top management commitment, resource allocation will be inadequate. After cognition, strategic integration enables resources to be deployed effectively. Collaboration mechanisms then sustain momentum. Jumping to collaboration without addressing cognition or resources leads to "green theater" (symbolic but ineffective initiatives).

Third, for SMEs facing resource constraints, start with low-cost mechanisms: cross-functional green teams (zero cost), digital collaboration platforms (free tiers available), linking green behaviors to non-financial recognition (certificates, public praise), and one-day volunteer programs (paid time off). Only after demonstrating positive ROI should financial incentives be introduced.

7. Conclusion

7.1 Summary of Findings and Theoretical Contribution

This study provided a comprehensive analysis of GHRM implementation challenges. In response to the three research questions: (RQ1) major barriers cluster into cognitive, resource, and integration categories, each supported by recent empirical evidence; (RQ2) these barriers are systemic and mutually reinforcing—low cognition reduces resources, which

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exacerbates integration difficulties, which reinforces cultural resistance; (RQ3) the "Cognition–Strategy–Resources–Collaboration" four-in-one framework offers an integrated solution, with case evidence demonstrating successful implementation pathways.

The primary theoretical contribution is this framework, which moves beyond piecemeal checklists to specify interdependencies among implementation drivers. Unlike prior frameworks that list barriers or practices independently, this framework shows how addressing one dimension without others leads to failure. The framework also integrates three theoretical perspectives (AMO, institutional, social identity) into a coherent process model.

Table 3. Summary of Problems, Countermeasures, and Best Practice Cases

Problem Category	Specific Problem	Countermeasure	Best Practice Case (Key Mechanism)	Quantified Outcome
Cognitive	Low top management commitment	Link executive compensation to ESG	Danone (20-25% bonus tied to climate goals)	27% emissions reduction; 18 hrs board ESG time
Cognitive	Low employee awareness	Gamified engagement & purpose alignment	IKEA (Green Warrior); Patagonia (paid activism)	€12M savings; 25% higher retention
Resource	Cost & expertise constraints	Digital tools & phased upskilling	Google (AI optimization, virtual recruitment)	30% energy reduction; 45K tCO2e travel saved
Integration (System)	System disconnect	Embed GHRM into core strategy	Shell (skills audit); Microsoft (carbon fee)	85% mobility into low-carbon roles; 23% emissions reduction
Integration (Culture)	Cultural resistance	Cross-functional collaboration	Neste (CEO committee); Interface (Eco Teams)	€5B→€30B market cap; $450M cost savings

7.2 Managerial Implications

In summary, managers should: (1) audit GHRM implementation across four dimensions; (2) sequence interventions (cognition → strategy → resources → collaboration); (3) adapt the framework for SMEs using low-cost mechanisms; (4) recognize that cultural resistance is a symptom, not a root cause, and address underlying cognition and resource gaps.

7.3 Limitations and Future Research

This study has several limitations.

First, reliance on secondary data may not capture tacit knowledge, informal practices, or implementation failures that are not reported in corporate sustainability reports (which tend

to highlight successes). Future research should use primary data collection methods (interviews, surveys, ethnographic observation) to validate the framework and uncover unobserved barriers.

Second, the case examples predominantly feature large multinationals. Although SMEs were included (Vaude, Toast Ale, Fairphone), the sample size is small. Future research should empirically test the framework in SME and emerging-economy contexts, where resource constraints are more severe but also where GHRM may offer competitive differentiation.

Third, the proposed framework requires longitudinal validation to assess causality. The current study identifies correlations and sequences (e.g., cognition appears to precede resource allocation), but experimental or quasi-experimental designs are needed to establish causal direction. For example, does increasing top management cognition cause improved resource allocation, or do firms with more resources also invest in cognition-building activities?

Fourth, the framework does not fully account for external stakeholder pressures (e.g., activist investors, NGOs, media). Future research should integrate stakeholder theory to explain how external pressures moderate the effectiveness of internal GHRM implementation.

Fifth, digital technologies (AI-powered carbon tracking, blockchain-verified supply chains, IoT-enabled energy monitoring) were mentioned in examples (Google's AI, Salesforce's Sustainability Cloud) but not systematically theorized. Future research should explore how Industry 4.0 technologies enable or constrain GHRM implementation, including potential negative effects (e.g., surveillance, data privacy concerns).

Finally, cross-cultural and cross-sectoral comparative studies are needed. Does the framework operate differently in collectivist vs. individualist cultures? In highly regulated vs. lightly regulated industries? In high-emission vs. low-emission sectors? Such comparisons would enhance generalizability.

7.4 Recommendations for Policy Makers

Beyond organizational actions, policy makers can facilitate GHRM implementation through: (a) providing tax incentives or subsidies for green training programs, particularly for SMEs; (b) developing national occupational standards for "green HR professional" certifications; (c) mandating ESG disclosure at the workforce level (e.g., requiring listed companies to report employee green training hours and carbon literacy rates); (d) funding public-private partnerships to develop open-source GHRM toolkits and case databases. Such policies would reduce the resource burden on individual firms and accelerate the diffusion of best practices.

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